KEF®

R

REFERENCE

MODEL 209 AND MODEL 208
INSTALLATION MANUAL

Applicable for Reference Series Models 209 and 208, model numbers SP3557 and SP3556

WARNING

TO REDUCE THE RISK OF FIRE OR ELECTRICAL SHOCK, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE

CAUTION
RISK OF
ELECTRIC SHOCK
DO NOT OPEN
CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK). NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL

Explanation of Graphical Symbols

The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of a sufficient magnitude to constitute a risk of electrical shock to persons.

The exclamation mark within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

- A combined mains power input lead and country specific mains plug is provided.
- Check before connecting to your local mains supply that the local supply voltage is the same as that marked on the rear panel. If it is not, check with your supplier before proceeding.

WARNING:

Due to the mains switch being located on the rear panel, the apparatus must be located in an open area without anything obstructing access to the mains switch.

Because this is a Class I product it must be connected to the protective earth connection.

The mains plug or power connector must be readily accessible to allow the power to be removed from this product.

CAUTION:

- To prevent electric shock, do not open the rear panel.
- This product is for indoor use only.
- This electrical apparatus should not be exposed to dripping or splashing and care should be taken not to place objects for holding liquids, such as a vase or drinks container, on top of this apparatus.
- Do not install near any heat source such as radiators, stoves or other appliances that produce heat.
- Ensure that the power plug and cord are correct for your sockets. Do not use if they show any signs of damage.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following conditions: (1) this device does not cause harmful interference, and (2) this device will accept any interference received, including interference that may cause undesired operation.

The manufacturer is not responsible for any radio or TV interference caused by unauthorised modifications to this equipment. Such modifications could void the user authority to operate the equipment.

NOTE:

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause detrimental interference to radio communications.

However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is needed.
- Consult the dealer or an experienced radio/TV technician for help.

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Important Safety Instructions

Please take heed of the following before using the KEF Reference Series Subwoofer. Note also that the word "appliance" shall refer to the KEF Reference Series Model 209/ Model 208 Subwoofer, or any part of it.

1. **Read Instructions -** All the Safety and Operating Instructions should be read before the appliance is operated.

2. **Retain Instructions -** The Safety and Operating Instructions should be retained for future reference.

3. **Heed Warnings -** All warnings on the appliance and in the Operating Instructions should be adhered to.

4. **Follow Instructions -** All Operating and Use Instructions should be followed.

5. **Water and Moisture -** The appliance should not be used in or near water - for example, near a bathtub, washbowl, kitchen sink, laundry tub, in a wet basement, or near a swimming pool, and the like. This apparatus should only be used in moderate climates.

6. **Ventilation -** The appliance should be situated so that its location or position does no interfere with its proper ventilation. The rear panel should be at least **15cm** from any object. The ventilation should not be impeded by covering the ventilation openings with items such as table cloths, curtains etc.

7. **Heat -** The appliance should be situated away from heat sources such as radiators, heat registers, stoves or other appliances (including amplifiers) that produce heat. No naked flame sources such as lighted candles should be placed on the apparatus.

8. **Power Sources -** The appliance should be connected to a power supply only of the type described in the operating instructions or as marked on the appliance.

9. **Grounding or Polarisation -** The precautions should be taken so that the grounding or polarisation means of an appliance are not defeated.

10. **Power-cord Protection -** Power supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords at plugs, convenience receptacles and the point where they exit from the appliance.

11. **Cleaning -** The appliance should be cleaned only as recommended by the manufacturer.

12. **Non-use Periods -** The power cord of the appliance should be unplugged from the outlet during lightening storms or when left unused for a long period of time.

13. **Damage Requiring Service -** The appliance should be serviced by qualified service personnel when:
    a) The power supply cord or the plug has been damaged; *or*
    b) Objects have fallen or liquid has been spilled on the appliance; *or*
    c) The appliance has been exposed to rain; *or*
    d) The appliance does not appear to operate normally or exhibits a marked change in performance; *or*
    e) The appliance has been dropped or the enclosure damaged.

14. **Servicing -** The user shall not attempt to service the appliance beyond that described in the Operating Instructions. All other servicing should be referred to qualified service personnel.

15. Only use attachments/accessories specified by the manufacturer.

16. Use only with a cart, stand. tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When the cart is used, use caution when moving the cart/apparatus combination to avoid injury.

17. The mains plug is used as the disconnect device. It shall remain readily operable and should not be obstructed during intended use. To completely disconnect the apparatus from supply mains, the plug must be removed from the mains socket outlet completely.

Important Information

Thank you for purchasing this KEF Reference Series subwoofer. It has been designed to faithfully reproduce high quality sound over many years of use. Please take a little time to read these instructions prior to use.

Your KEF Reference subwoofer is extremely heavy. Installed correctly on a smooth, level surface, it should be entirely safe to listen to and to live with.

However, if you have small children, large pets, the infirm, uneven flooring or unusually thick carpeting in your home, then correct adjustment of the foot assemblies is imperative for safe, stable operation is to be achieved.

1. Read this manual carefully, especially the safety information, before attempting to assemble and operate the system. Please take heed of the following safety instructions before using the appliance. The word "appliance" shall refer to the KEF Reference Series Model 209/Model 208 subwoofer, or any part of it. The Safety and Operating Instructions should be retained for future reference. All warnings on the appliance and in the Operating Instructions should be adhered to.

2. All Operating and Use Instructions should be followed. Follow the unpacking procedure shown. Please note that lifting the heavy KEF Reference Series Model 209/Model 208 subwoofer will require two able-bodied persons, or consult your dealer for assistance.

3. Make sure the feet are correctly fitted before the subwoofer is lifted to the correct position. If the subwoofer is to be used on delicate wooden flooring please use the supplied protective cups which fit under the feet.

4. Trailing cables are dangerous. Ensure that all cables are secure and tidy. The appliance should be connected to a power supply only of the type as marked on the appliance. Precautions should be taken so that the grounding and polarisation of the mains connection are not defeated. The power supply cord should be routed so that they are not likely to be walked on or pinched by items placed upon or against it.

5. When stripping cables use only tools designed specifically for the purpose ie: correct wire cutters or cable strippers. Do not attempt to strip cables with a knife as this could result in serious injury.

6. The appliance should not be used in or near water or moisture - for example, near a bathtub, washbowl, kitchen sink, laundry tub, in a wet basement, or near a swimming pool, and the like.

7. The appliance should be situated so that its location or position does no interfere with its proper ventilation. The rear panel should be at least 15cm from any object. The subwoofer should be situated away from heat sources such as radiators, heat registers, stoves or other appliances (including other amplifiers) that produce heat.

8. The appliance should be cleaned only as recommended in this manual.

9. The appliance should only be serviced by qualified service personnel. The subwoofer should be serviced if :
    a) The power supply cord or the plug has been damaged; or
    b) Objects have fallen or liquid has been spilled on the appliance; or
    c) The appliance has been exposed to rain or moisture; or
    d) The appliance does not appear to operate normally or exhibits a marked change in performance; or
    e) The appliance has been dropped or the enclosure damaged.

General Care of your System

1. Avoid temperature extremes.

2. Avoid damp.

3. Avoid direct sunlight.

4. Clean with the KEF cloth provided.

5. Do not use spirit based cleaners. ⚠

If you are at all uncertain about setting up, operating or caring for your system your dealer will be pleased to assist you.

Correct

Wrong

Adjustment

Caution/Warning

Electrical Warning

Positive/RED

Negative/BLACK

Switch off appliance

Option

Read

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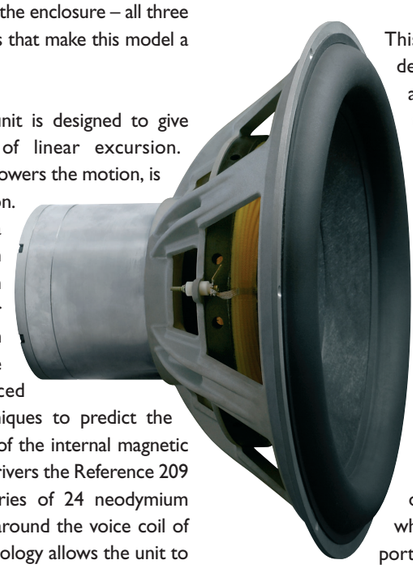
MODEL 209

Introduction and Overview

The KEF Reference Series 209 subwoofer is a 'state of the art' subwoofer for use in the very best home theatre and stereo systems. Every component is critically designed to give optimum acoustic performance in a compact, elegant enclosure. The key components in the 209 subwoofer are the drive unit, the amplifier and the enclosure – all three of these contain innovations that make this model a class leader.

The 18" (450mm) drive unit is designed to give 60mm (peak to peak) of linear excursion. The magnetic field, which powers the motion, is constant over that region.



The magnet system is a radically different design from that found in conventional loudspeaker drivers, it has been designed by KEF from the ground up using advanced computer modelling techniques to predict the behaviour and orientation of the internal magnetic field. Unlike conventional drivers the Reference 209 magnet system uses a series of 24 neodymium magnets radially arranged around the voice coil of the driver. This unusual topology allows the unit to have a remarkably long range of motion while maintaining a very strong magnetic field around the voice coil. Together with a double suspension and massive roll surround this allows high levels of bass to be reproduced with very low distortion - giving a sense of power and clarity not normally found in high end subwoofers.

The amplifier section is custom designed to get the very best out of the new drive unit. A 1000W class D power amplifier with switched mode power supply allows top end performance in a neat and tidy package. In addition, the front end incorporates Digital Signal Processing (DSP) which is used to provide comprehensive equalization options and an innovative room acoustic correction system (see page 9 for an overview and page 23 for operation guide).

The enclosure is beautiful on the outside and highly technical on the inside. Attached to the inner surface are 30 'ACE' modules - tubes of activated carbon which increase the effective internal acoustic volume by a factor of 2. ACE technology (see page 8) is KEF's solution to the oldest catch 22 in loudspeaker design – that to get good bass extension with good efficiency you need a large enclosure. The Reference Series 209 subwoofer gives the kind of bass extension normally found in subwoofers twice the size.

This subwoofer is specifically designed with bass speed and articulation in mind, because of this we chose to make the subwoofer a closed box design. A closed box design does not rely on the resonance of port or passive radiator for output. All sound radiation is from the 18" driver the motion of which is carefully controlled and damped by the amplifier and large magnet system, there are no port resonances to continue ringing after a sudden bass event. Additionally it is not possible to recreate extreme low bass output with a ported system, which cannot radiate below the port tuning frequency.

All this technology is neatly packaged in an elegant enclosure with straightforward connection options and an easy to use remote controlled user interface.

You can run the Reference Series 209 subwoofer with the default 'switch on' settings or experiment with the DSP based equalisation options to fine tune it to your particular system setup.

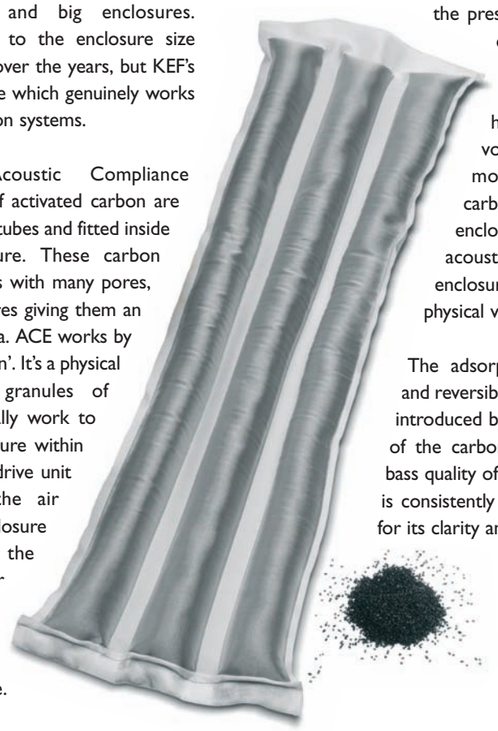
Line level or high level speaker inputs are available to allow flexibility in set-ups. In addition, line level connections are possible as either single ended (phono) or balanced (XLR).

For ease of use and installation the subwoofer is equipped with an IR remote control allowing for easy adjustment of subwoofer level, cut off frequency and phase from your listening position. A microphone is also included to allow the subwoofer to measure the sound produced within your room and compensate for abnormalities using integrated room correction algorithms.

ACE technology

The laws of physics dictate that to get good bass extension out of a loudspeaker you need a large enclosure volume, and to get high output levels you need to move a lot of air. This is why the more expensive loudspeaker systems have large or multiple bass drivers and big enclosures. Many potential solutions to the enclosure size problem have been tried over the years, but KEF's ACE technology is the one which genuinely works and is useable in production systems.

ACE stands for Acoustic Compliance Enhancement. Granules of activated carbon are packed into porous fabric tubes and fitted inside the loudspeaker enclosure. These carbon granules are highly porous with many pores, macropores and micropores giving them an incredibly high surface area. ACE works by a process called 'adsorption'. It's a physical process whereby the granules of activated carbon continually work to reduce the acoustic pressure within an enclosure. When the drive unit cone moves inwards the air pressure inside the enclosure increases. This triggers the carbon granules to pull air molecules onto the surface of the material by the weak, gravity type, Van de Waals force.



This has the effect of reducing the overall air pressure inside the enclosure. When the cone moves out, and acts to expand the air inside the enclosure and reduce its pressure, the granules 'give out' air molecules, again reducing the pressure change. A smaller change in the internal enclosure pressure is equivalent to having a larger enclosure volume. So by placing modules of activated carbon granules inside the enclosure we are getting the acoustic performance of an enclosure with a much larger physical volume.

The adsorption process is linear and reversible, there is no distortion introduced because of the operation of the carbon granules. In fact, the bass quality of ACE loaded enclosures is consistently admired by audiophiles for its clarity and detail.

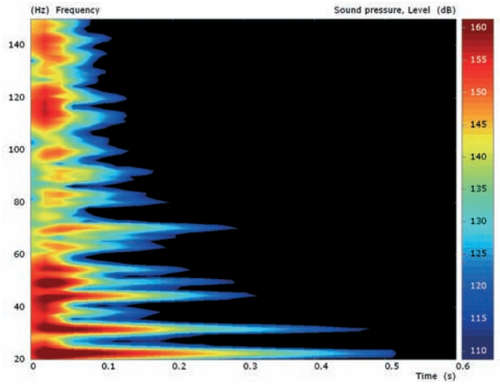
acoustic compliance enhancement

Room Correction

The listening room has a major impact on the sound of loudspeakers, particularly at low frequencies. In this region, standing wave resonances in the room result in large peaks and dips in the loudspeaker response.

It is very difficult to compensate for the effect of the room. This is mainly because the effect is not uniform but is different at every location in the room. If one were to perfectly correct the subwoofer response in one location it would inevitably become worse elsewhere. KEF engineers made the discovery that the acoustic behaviour of the room can be separated into two distinct parts, one part that describes all of the spatial variation in the room and a second part that describes the resonant behaviour in the room. As this second resonant part is independent of the loudspeaker and listener positions it can be electronically corrected for all locations in the room simultaneously.

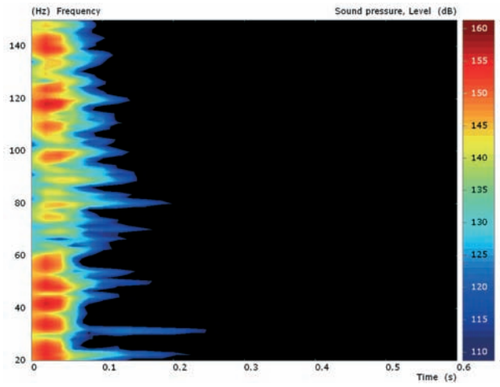
Before room correction.



KEF has developed an innovative room correction system that analyses the acoustical characteristics of the room and then designs a digital compensation filter to optimally correct the subwoofer response. This method of room correction gives a very significant audible improvement in the subjective performance of the bass, it sounds tighter and more defined. Best of all, it works wherever you are in the room.

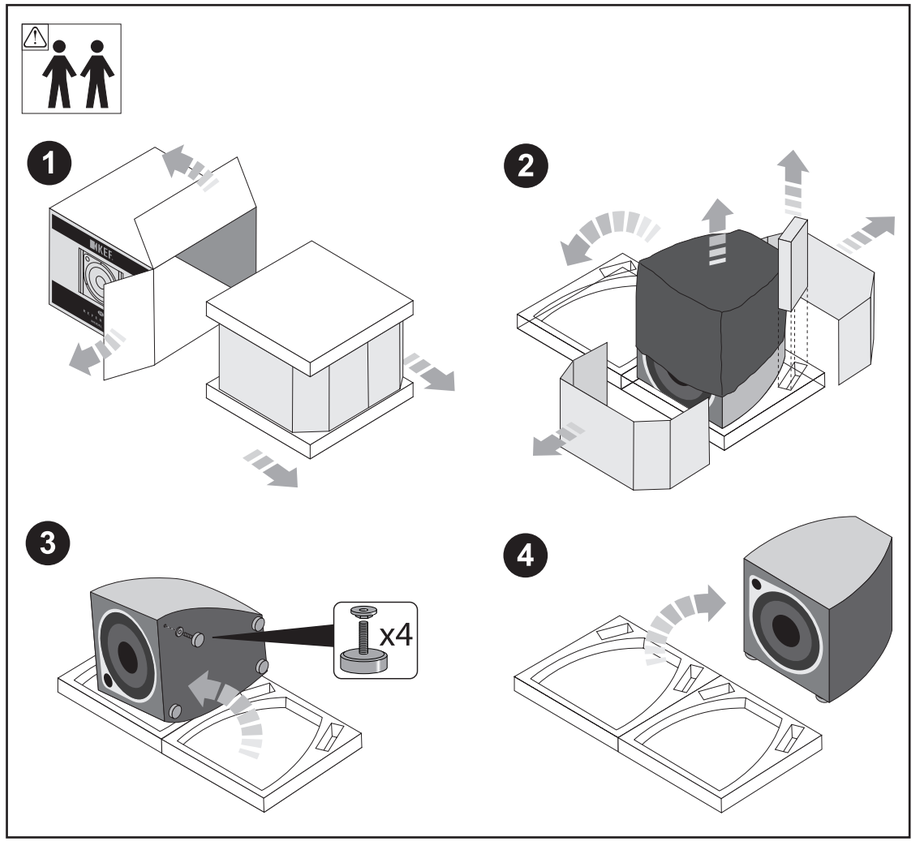
An additional benefit of this method of room correction is that it makes positioning of the subwoofer much simpler. Traditionally it is advisable to position subwoofers away from walls and corners as these locations result in very strong excitation of the room resonances. With the KEF room correction system, however, the resonances are electronically compensated and there is no problem with locating the subwoofer close to walls or in the corner of a room.

After room correction.



Installation and Operation

Unpacking, Handling and Aftercare



Unpack your subwoofer carefully and inspect for any sign of damage. Your subwoofer left KEF's manufacturing facility in the UK in perfect condition. If any damage is apparent, you should notify your retailer or consultant immediately. Retain the packaging in case a need arises for you to transport the subwoofer at a later date.

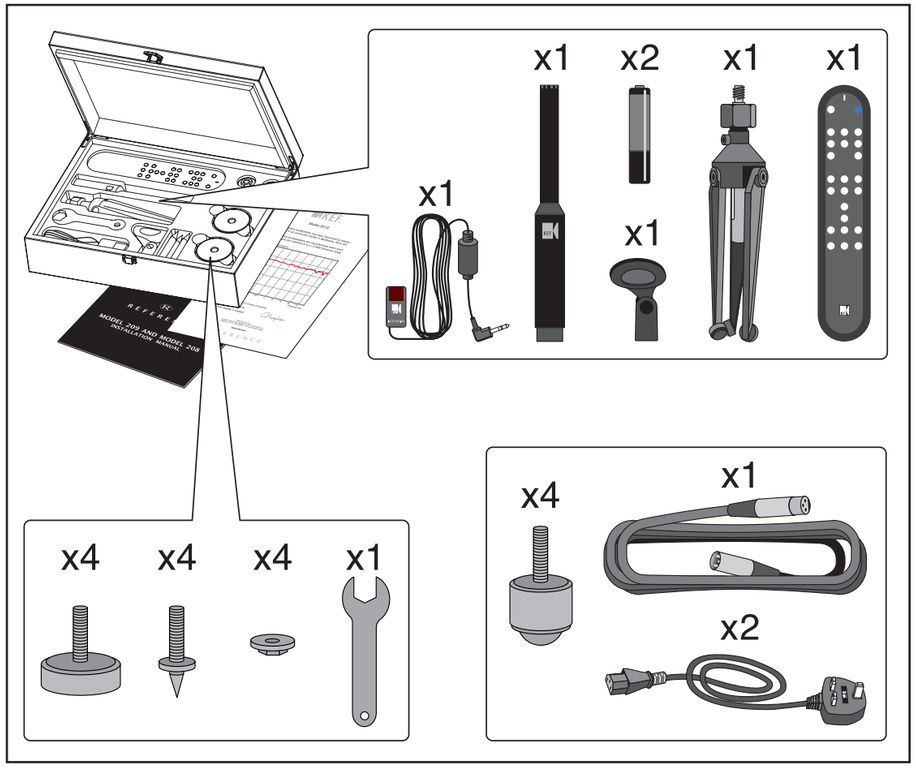
You will notice that a special KEF care-pack is included with the subwoofer. This pack contains a cleaning cloth and all the required accessories for connecting and positioning your loudspeakers. The care pack also contains the unique product build certificate. This is a valuable document and guarantees the quality and craftsmanship of your subwoofer.

The cabinet is finished in real wood veneer and should be treated with the same care with which you would treat fine furniture. A suitable cleaning cloth is included in the customer care pack to maintain the original finish and lustre. It is normal for the appearance of wood veneer to change with the passing of time, but locations in direct sunlight should, if possible, be avoided. Furthermore the cabinet should not be allowed to become wet.

Each Reference Series 209 subwoofer is supplied with KEF designed substantial spikes and locking nuts (also in the care pack). This enables fine adjustment of level, depending on your preferred location of the loudspeakers whatever the floor covering: carpet, tile or block wood. In addition to the spikes and locking nuts each Model 209 also comes with casters. The casters should only be used for transporting and moving the subwoofer as they do not offer the stability required when the subwoofer is in operation.

The Reference Series 209 subwoofer is of a closed box design. As well as producing the best acoustical performance, the cabinet is sealed to prevent moisture ingression. It is therefore important that the rear panel, drive unit and trim ring are not removed for any period of time especially in a humid environment.

Accessories



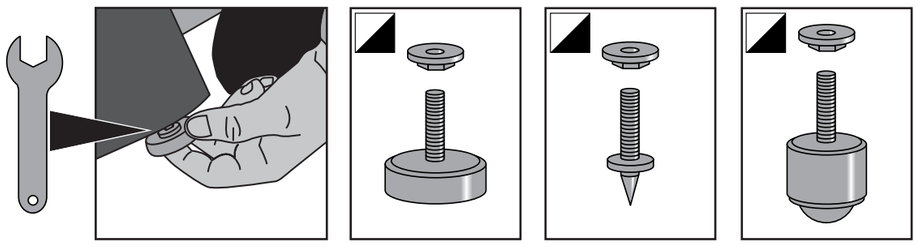
Adjusting the Feet and/or Spikes

Under normal circumstances your subwoofer will be commissioned by your retailer or consultant, who will have been trained in their installation by KEF.

KEF strongly recommend that you do not attempt to level your loudspeakers single-handed. Recruit the assistance of another adult - or consult an authorised KEF Reference outlet for assistance which may be chargeable if the purchase was not made through them originally.

The spike/locking nut combination supplied is designed to provide small adjustments, not to compensate for seriously irregular floors.

Best results will be obtained if the subwoofer is level and stable. Check the general stability of the subwoofer by gently rocking it from side to side, front-to-back and diagonally. Adjust the height of each foot to ensure that the subwoofer does not rock at all.



Subwoofer Positioning

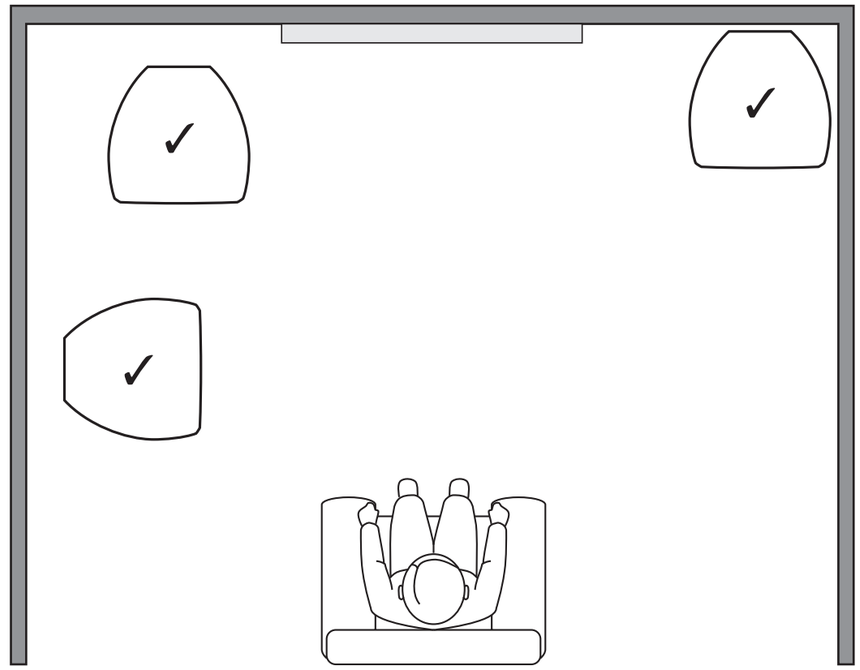
The listening room is one of the most variable elements in the hi-fi chain and its effect cannot be emphasised too strongly, nor can its effects be reliably predicted. This is where the room correction feature on the Reference Series 209 subwoofer becomes such an important feature.

As the sub-bass (low frequency) sound produced by the subwoofer is close to omni-directional positioning of the subwoofer is less critical than with full range conventional speakers. However, it is advised that the subwoofer is not positioned too close to the listener.

It is often recommend that subwoofers are not placed in the corners of the room, near soft furnishings (which will deaden the sound) or near reflective surfaces (which may brighten up the sound). The room correction feature of the Reference Series 209 subwoofer will help compensate for all these effects.

KEF recommend you to place the Reference Series 209 subwoofer in a central position in the room and execute the room correction setup. This is an initial compensation for your unique room. Then move the subwoofer into a few acceptable positions and compare the sound. Pick the location which gives the most satisfying sound available from the room.

When the subwoofer is in its final chosen position, then repeat the room correction setup and select the preset equalisation setting to optimise the sound further.



Rear Panel Information

Mains power socket and fuse holder.
Please check that the voltage indicated is correct for your country's mains supply voltage as this subwoofer comes in 110V or 240V versions that are not inter-changeable. Please return to your KEF retailer if the setting is incorrect for the voltage supply in your country so that it can be changed internally.

On/Off switch.
Please turn off your subwoofer during long periods of non-use.

Speaker/high level input.
Used when the subwoofer is to be driven from the output of the main speaker power amplifier.

Line input Left and Right.
These are used to connect the subwoofer to the line level signal from a pre-amplifier. Please note that single ended (phono) or balanced (XLR) connections are available however they must not be used simultaneously. If only one set of line outputs is available on your pre-amplifier use Y connectors to split the L and R signals between the pre-amplifier and the KEF Reference Series 209 subwoofer or use the Line level LFE input described below.

Line input LFE.
This dedicated line level input is specifically for LFE (Low Frequency Effects) output from a surround sound processor. Please note that single ended (phono) or balanced (XLR) connections are available however they must not be used simultaneously. The LFE input to the subwoofer is not be affected by the frequency or slope settings so there will be no conflict with the bass management settings applied by the external surround sound processor.

Microphone input.
Connect the supplied microphone with the XLR cable to the microphone input and execute the room correction setup. The microphone may be removed after this set up has been fully completed.

External IR input.
The Reference Series 209 subwoofer is only controllable with the supplied remote control. However the supplied external IR receiver can be connected to this input enabling reception from the remote control even if the subwoofer is hidden out of site of the remote control and the main listening position.

Ext. IR
MIC INPUT
LINE INPUT LFE
LINE INPUT LEFT
LINE INPUT RIGHT
LEFT
SPEAKER INPUT
RIGHT
KEF
REFERENCE
MODEL 209
GP ACOUSTICS (UK) LTD. MAIDSTONE, ENGLAND
POWER
ON
OFF
CAUTION
RISK OF ELECTRIC SHOCK DO NOT OPEN
AVIS:RISQUE DE CHOC ELECTRONIQUE NE PAS OUVRIR.
CAUTION: NO USER-SERVICEABLE PARTS INSIDE REFER SERVICING TO QUALIFIED SERVICE PERSONNEL
WARNING: TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THE UNIT TO RAIN OR MOISTURE
WARNING: THIS PANEL GETS HOT, DO NOT OBSTRUCT VENTILATION
CONFORMS TO ANSI/UL STD. 60065 CERTIFIED TO CAN/CSA STD C22.2 NO. 60065
Tested To Comply With FCC Standards FOR HOME OR OFFICE USE
~220-240VAC 50-60Hz
FUSE TYPE: T6,3AH 250V
CAUTION: DISCONNECT SUPPLY CORD BEFORE CHANGING FUSE. FOR CONTINUED PROTECTION AGAINST FIRE HAZARD, REPLACE ONLY WITH THE SAME TYPE AND RATING FUSE
ATTENTION: DEBRANCHER AVANT DE REMPLACER LE FUSIBLE REMPLACER UNIQUEMENT PAR UN FUSIBLE DE MEME TYPE

Remote Control and Control Functionality

Power.
Puts the Reference Series 209 subwoofer into or out of standby.

Auto/Manual.
Switches the Reference Series 209 subwoofer between automatic mode or manual mode. In automatic mode the subwoofer will go into standby automatically after approximately 30 minutes of silence. It will automatically come out of standby instantly when a audio signal is applied to the inputs.

Phase.
Adjusts the phase of the subwoofer output relative to your main speakers from 0 to 180 degrees in 5 degree steps.

Polarity.
This switches the acoustic polarity of the output by 180 degrees. The phase and polarity settings apply to both the Left and Right line level inputs and the LFE line level input.

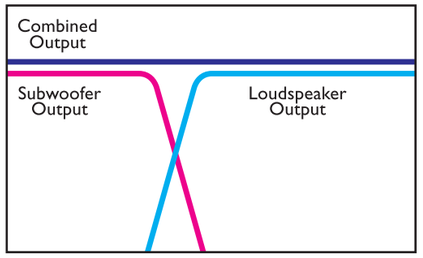
Vol.
This decreases or increases the subwoofers volume relative to the main speakers.

Slope.
Switches the Low Pass Filter slope between 12 (shallow) and 24dB per octave (steep). This should be set to allow the best integration with your main speakers.

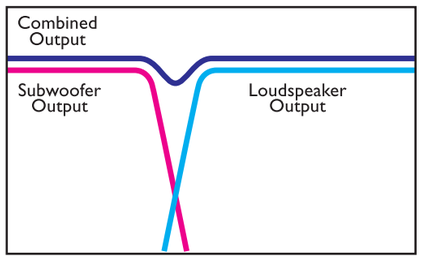
Frequency.
Increases or decreases the internal low pass filter cut off frequency in the subwoofer between 25Hz and 150Hz so that it integrates with the main speakers.

The Frequency and Slope controls apply only to the Left and Right line level inputs and are not applicable to the LFE input where it is assumed an external surround sound processor is controlling the bass management externally.

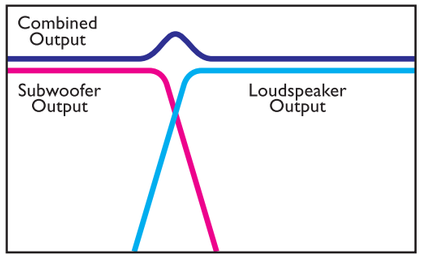
Subwoofer/Satellite Integration : Correct



Subwoofer/Satellite Integration : Too Low.
Increase the frequency.



Subwoofer/Satellite Integration : Too High.
Reduce the frequency.



L+R EQ.
Selects the Equalisation (EQ) that is applied to the LEFT and RIGHT line level inputs. There are 7 different EQs as defined on page 22. The subwoofer will default to the standard "flat" EQ unless an alternative is selected.

LFE EQ.
Selects the EQ that is applied to the LFE line level input. There are 7 different EQs as defined on page 22. The subwoofer will default to the standard EQ until an alternative is selected. It is intentional that the LFE EQ can be set differently from the L+R EQ so that the subwoofer can be optimised for both a stereo system and a AV system without having to change any wiring.

RCL.
Increases or decreases the Room Correction Level applied to the acoustic output.

Room Correction Setup.
Starts the Room Correction Setup process for which the microphone must be connected

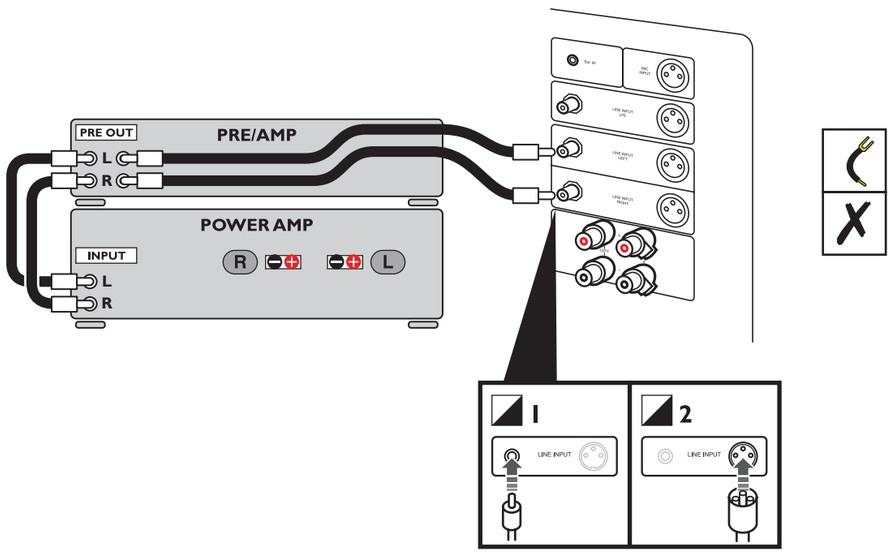
Select.
This enables you to confirm the room correction settings at each stage

Presets.
Allows the user to select one of 6 different general settings for the KEF Reference Series 209 subwoofer. Pressing and holding the Preset button will save all of the current settings (Volume, Polarity, Phase, Frequency, Slope, Room Correction Level and EQs) to that numbered Preset.

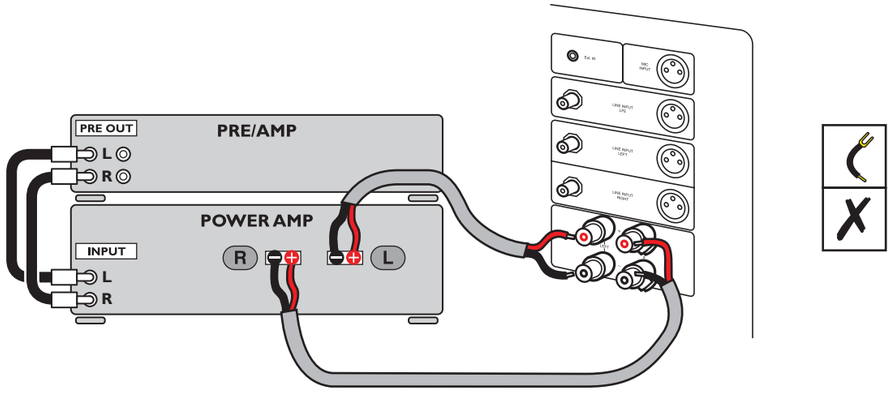
Connections, Setup and Fine Tuning

All connections should be made with the amplifier switched OFF. Ensure the integrity of all connections prior to switching the amplifier ON.

Stereo line level connections



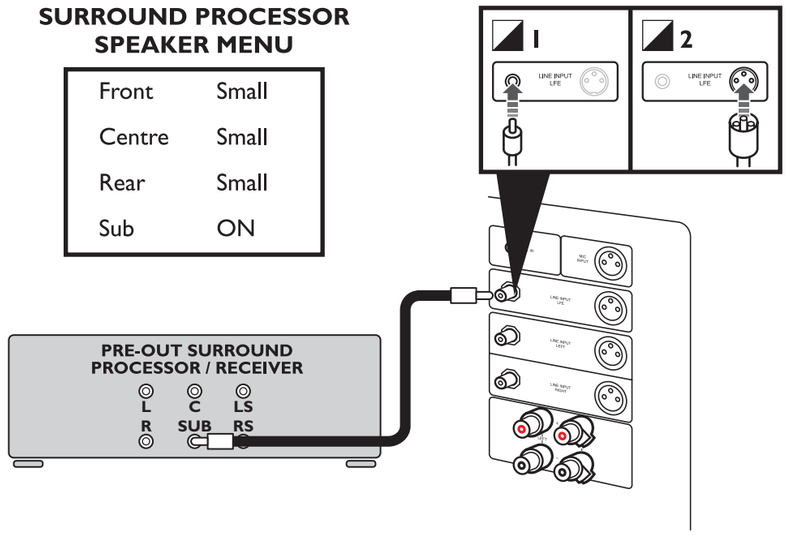
Stereo speaker level connections



LFE line level connections
(For use with bass limited (small) main loudspeakers)

SURROUND PROCESSOR SPEAKER MENU

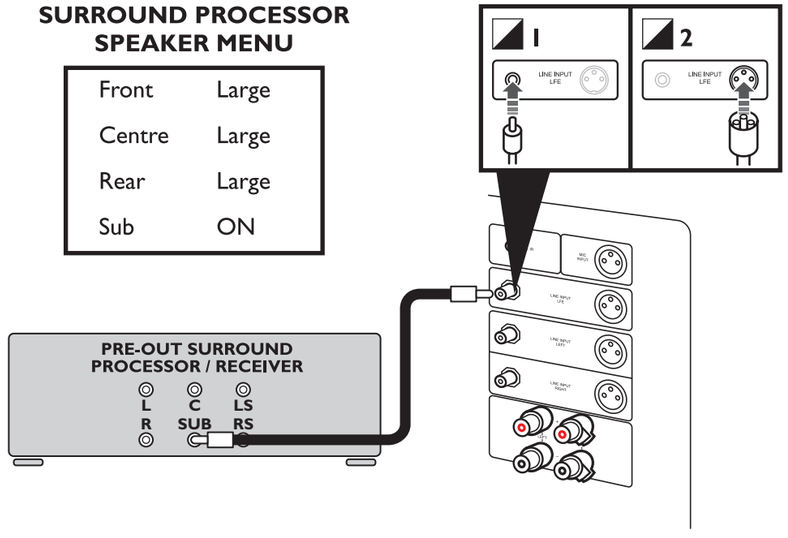
Front	Small
Centre	Small
Rear	Small
Sub	ON



LFE line level connections
(For use with full range (large) main loudspeakers)

SURROUND PROCESSOR SPEAKER MENU

Front	Large
Centre	Large
Rear	Large
Sub	ON



Movie only setup through the LFE input.

This dedicated line level input is specifically for the LFE (Low Frequency Effects) output from a surround sound A/V processor. Please note that single ended (phono) or balanced (XLR) connections are available, however, they must not be used simultaneously. The LFE input to the subwoofer will not be affected by the frequency or slope settings which apply only to the Left and Right channel line inputs.

Once your subwoofer is connected and powered up it needs to be integrated into your home cinema system. To do this you will need to follow the set-up procedure for your surround sound processor. Set the subwoofer volume to 50 and the phase to 0. In the surround sound processor's speaker menu, ensure that the subwoofer is set to 'on'. If using smaller satellite speakers then set the speaker size to 'small'. KEF would recommend starting with the 'small' setting if you are unsure.

If you are using full range speakers set the speaker size to 'large'. Use the processor's controls to adjust the level of the subwoofer at the same time as setting each of the channel levels.

Music only setup through the Left/Right inputs.

To increase the low-frequency extension of your existing stereo speakers connect the amplifier's line level outputs to the subwoofer Left and Right line level inputs. If line level outputs are not available then connect the Left and Right amplifier speaker outputs to the speaker inputs of the subwoofer. Once the subwoofer is connected and the power is switched on it needs to be acoustically integrated into your existing system. To do this you will need to use the volume, frequency and phase controls on the subwoofer's remote control. The remote control allows you to do this whilst seated in your normal listening position.

First select the subwoofer low-pass filter slope to match your main speakers. For a bass reflex design speaker the slope should be set to 24dB/octave. This applies to all the KEF Reference Series loudspeakers. For a closed box loudspeaker, however, the slope should be set to 12dB/octave.

Select a piece of music that you are familiar with which has a constant, repetitive bass line. Start with the level and frequency controls at the middle positions and the phase control set to 0. Adjust the level control until you are happy with the low frequency levels when compared with the main speakers. Now adjust the frequency control so that there is no obvious change in the level of the sound from very low frequencies to higher frequencies. Adjust the polarity and the phase control to achieve the smoothest integration between the subwoofer and the main speakers. KEF recommend you take some time making fine adjustments to the controls, whilst listening to a varied selection of music, until you are satisfied with the sound balance.

Once finished it is worth pressing and holding an available preset so that all the current settings are saved into that preset. These settings can then be recalled at any time by pressing the same preset button.

Combined movie and music setup.

The Reference Series 209 subwoofer can be used for both main speaker low frequency extension and the LFE channel reproduction for a surround sound system.

Set the subwoofer up as described in section 'Music Only Setup'. With the subwoofer correctly set up for stereo use, connect the LFE output from your surround processor to the LFE input of the subwoofer. Without making any adjustments to the subwoofer's controls, including the volume level, follow the set-up procedure on your surround processor to adjust the subwoofer volume level (as described in section 'Movie Only Setup').

Finally, separate EQ presets can be applied for both the stereo and LFE inputs (as detailed in 'Preset Equalization options', page 22).

Connecting to the speaker inputs (high level).

Speaker level or line level inputs are available to allow flexibility in set-ups for the Left and Right inputs. The specific LFE input is line level only to interface with an A/V processor.

The speaker input terminals will accept bare wire, spade or 4mm connectors. Most good quality loudspeaker cables have some indication, such as colour coding or 'ribbing' on the insulating material, indicating which conductor is '**+**' or positive. Connection to the subwoofer can then be made as follows:

The left channel amplifier output terminal marked '**+**' or coloured RED connects to the left subwoofer speaker input terminal marked '**+**'. The left channel amplifier output terminal marked '**-**' or coloured BLACK connects to the left subwoofer speaker input terminal marked '**-**'. Similarly, these instructions should be followed for making connections between the right channel amplifier output and the right subwoofer speaker input terminals. Correct polarity, or phase, is vital to the proper operation of the system.

Bare wire connections are the simplest to achieve and involve stripping 12.5mm (1.2in.) of insulation to expose the loudspeaker wire core. (You should twist together, using clean fingers, the ends of each multi-stranded core prior to the next stage to ensure a good signal contact). Having unscrewed the lower terminal cap, push the wire through the exposed hole in the terminal body and screw the cap down tightly. Make sure that no stray strands come into contact with the opposite terminal; this could cause a short circuit between the terminals and may damage your amplifier.

KEF recommends that high quality loudspeaker cable be used for connecting to your Reference Series Model 209 subwoofer high level inputs. It is good practice to keep the cables as short as possible.

Be aware that a higher quality run of cable will always give a more rewarding presentation than multiple runs of an inferior cable.

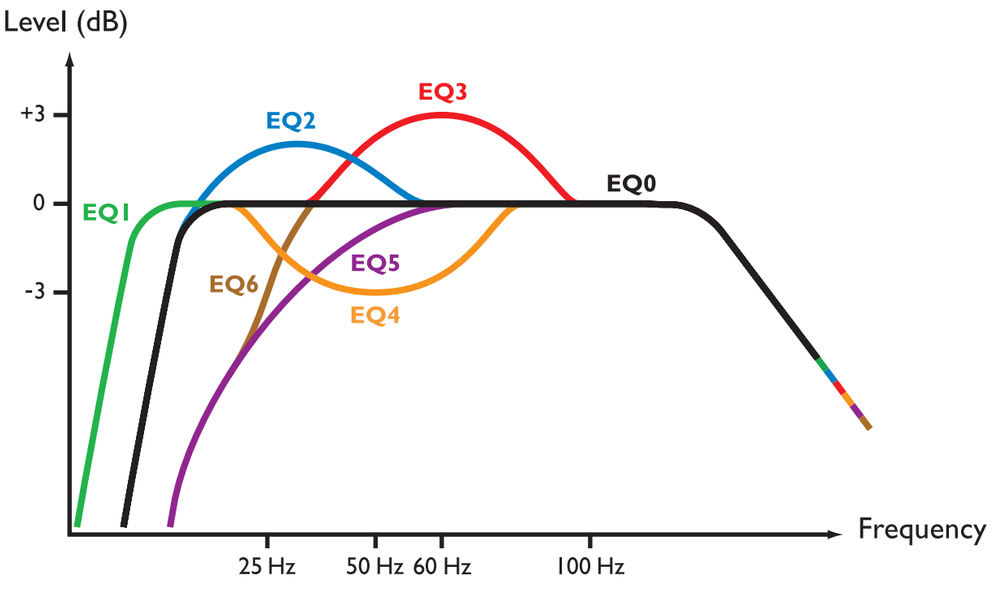
Poor quality cables can seriously compromise the overall sound of your hi-fi system.

Using the Preset Equalization options

Left and Right EQs and LFE EQs are pre defined by KEF's acoustics engineers to allow easy selection of the most useful response adjustments.

They can be independently selected enabling a different EQ to be applied to the L+R inputs and the LFE line level input.

EQ0 Standard (Default)
EQ1 Bass Extension
EQ2 Low Bass Lift
EQ3 Upper Bass Lift
EQ4 Mid Bass Cut
EQ5 High Pass Filter
EQ6 High Pass Filter with Upper Bass Lift

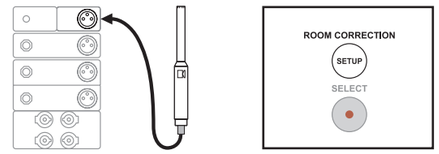


Using the Room Correction facility

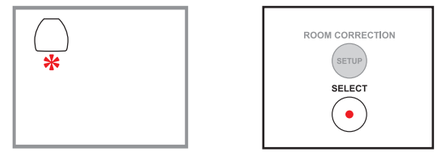
The Reference 209 subwoofer includes a room correction facility to optimise the performance in different listening environments.

In order to apply the room correction function to compensate for your specific room you need to connect the microphone and take four measurements.
These microphone measurements should be well spread out across the room and should not be concentrated around the listening position. Please note that you can press SETUP at any point to abort the room correction process and stop the sweep sounding.

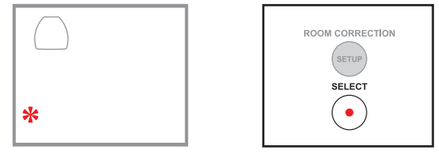
Connect the supplied KEF microphone with the supplied XLR lead to the rear of the subwoofer.
Press room correction SETUP on the remote control.



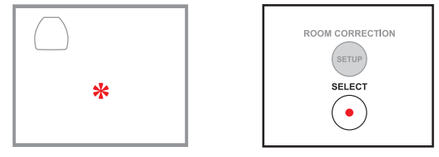
Remove the grille and place the microphone 2 inch (50mm) away from the subwoofer driver. *
Press SELECT and wait whilst a sweep is sounded.



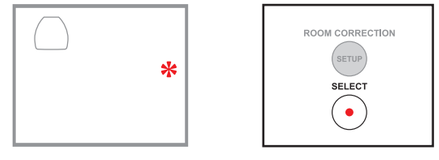
Place the microphone in a far left position. *
Press SELECT and wait whilst a sweep is sounded.



Place the microphone in a central position within the room. *
Press SELECT and wait whilst a sweep is sounded.



Place the microphone in a far right position. *
Press SELECT and wait whilst a sweep is sounded.



The new room correction algorithm is then automatically saved.
Finally, select the Room Correction Level to be applied to the acoustic output of the subwoofer.

The Room Correction Level can be switched off or altered between level 1, the minimum, to level 5 the maximum amount applied to the acoustic output. Room Correction Level 3 is the default value.

Grille

A dedicated grille assembly is supplied with your subwoofer. However, if you wish you may remove the grille by gently pulling it forward toward you. The grille is held on via 'pegs' that locate into the front baffle grille-peg sockets.

If required, the grille may be removed during use. KEF suggest the removal of the grille for serious listening, however we strongly recommend replacing the grill after use.

For cleaning purposes, the grille should be removed from the cabinets and brushed lightly with a soft brush. Alternatively, use a variable suction vacuum cleaner, with soft brush attachment.

Warranty

Your Reference Series Model 209 subwoofer is guaranteed against manufacturing defects in both materials and workmanship. For further details of how this guarantee affects you, please read the enclosed Warranty leaflet.

It should be noted, however, that failure of the loudspeaker due to abuse, improper or inappropriate use and/or operation or damage caused by other faults in your system are NOT covered within the terms of the guarantee.

Service Information.

Loudspeakers are inherently reliable and rarely give trouble. It is important to remember that faults arising in any part of the reproducing system will be heard via the loudspeakers and therefore when faults occur, careful and analytical diagnosis will be required to locate the actual source of trouble.

Faults in a loudspeaker will be audible on all programme sources. A fault which is evident only when playing CDs but not, for example, when using a radio tuner is unlikely to originate with the loudspeakers.

Service problems should be discussed in the first instance with the dealer from whom the loudspeakers were originally purchased. Generally, warranty claims are best handled by your dealer.

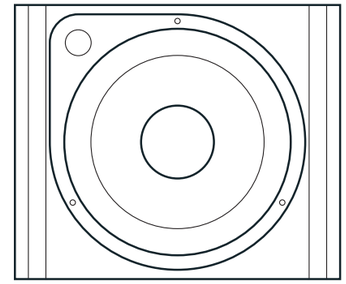
However, in case of difficulty, please contact:

Customer Services Department.
KEF Audio (UK), Eccleston Road, Tovil,
MAIDSTONE, Kent, ME15 6QP UK.
Telephone No.: +44 (0)1622 672261
Fax No.: +44 (0)1622 750653

www.kef.com

Specifications

MODEL 209



Design :
Closed Box, magnetically shielded

Drive Unit Array :
450mm (18in.) long-throw bass driver with radial magnet system allowing +/-30mm of linear excursion.

Frequency Response :
(± 3dB)
15Hz - 250Hz

Amplifier :
1000W Class D with switched mode power supply and DSP based control section.

Sensitivity :
(2.83V / 1m)
Active system

Maximum Output :
120dB

Low Pass Filter Range :
30 to 150Hz (-3dB)

Phase Adjustment Range :
0 to 180 degrees in 5 degree steps

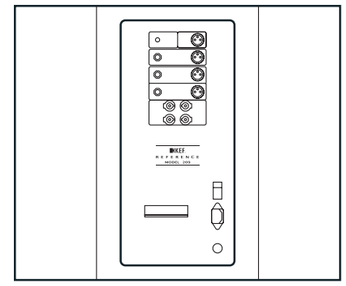
Impedance :
Active system

Bass Extension :
12Hz (-6dB) with EQ1

Weight :
51.9kg (114.4lbs)

Dimensions (H x W x D) :
530 x 629 x 629 mm
20.9 x 24.8 x 24.8 in.

Finishes :
Piano Black
High Gloss Cherry
High Gloss American Walnut
Satin Sycamore
Satin Black
Satin Cherry
Satin American Walnut



MODEL 208

Introduction and Overview

The subwoofer is the heart of any home theatre system, providing an exhilaration that brings the sound stage physically to life. That is why the same level of attention and care has been taken to develop the Reference Series Model 208 subwoofer as the rest of the Reference Series range.

Key components of any subwoofer are the drive unit, amplifier and enclosure, which in the Model 208 have been perfectly harmonised to deliver gloriously extended, immaculately controlled bass that floods the listening area.

A 300mm (12in.) drive unit designed with the highest quality components utilises an optimised Strontium Ferrite magnet system that gives 24mm (0.94in.) peak-to-peak of totally linear excursion. Delivering low distortion, accurately controlled bass whether for music or fast action cinema soundtracks.

To get the very best out of the drive unit a 500W Class D amplifier has been custom designed to form a seamless partnership. Utilising a switched mode power supply, top end performance can be delivered in a highly efficient unit without compromising cabinet design.

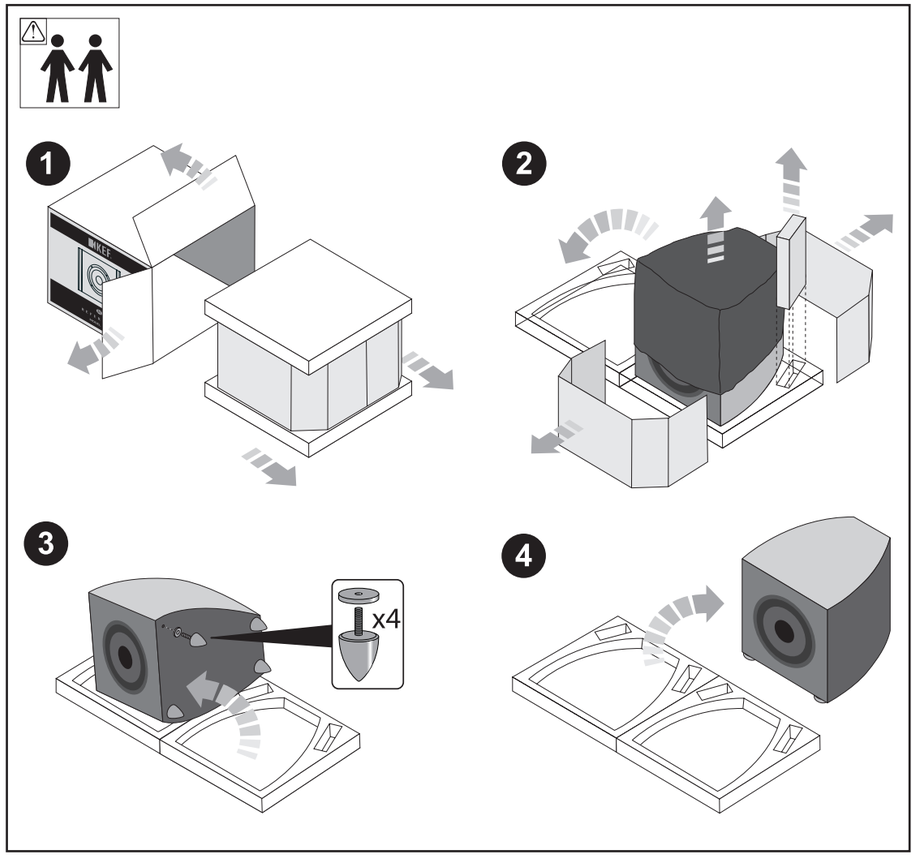
The acoustically inert cabinet is beautifully hand finished with a level of craftsmanship and attention to detail that complements the precision of the components it contains. The Bass reflex design incorporates a finely tuned port, delivering both performance and refinement.

Connectivity and flexibility are paramount which is why the Model 208 has been comprehensively specified. A range of connection options including phono, balanced XLR and high level speaker inputs ease installation. A cinema and music EQ option enables quick setup and the subwoofer level, crossover frequency, phase and slope can all be tuned to meet individual needs.

Overall, every element of the Model 208 has been designed to reproduce low frequency effects with delicacy and precision together with the excitement of sheer power and performance.

Installation and Operation

Unpacking, Handling and Aftercare



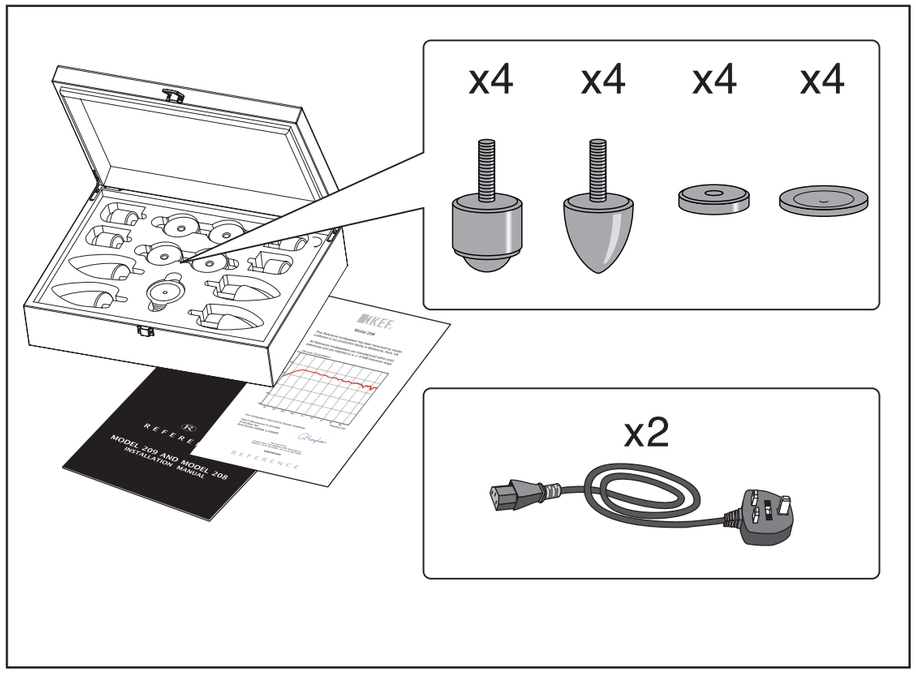
Unpack your subwoofer carefully and inspect for any sign of damage. Your subwoofer left KEF's manufacturing facility in the UK in perfect condition. If any damage is apparent, you should notify your retailer or consultant immediately. Retain the packaging in case a need arises for you to transport the subwoofer at a later date.

You will notice that a special KEF care-pack is included with the subwoofer. This pack contains all the required accessories for connecting and positioning your loudspeakers. The care pack also contains the unique product build certificate. This is a valuable document and guarantees the quality and craftsmanship of your subwoofer.

The cabinet is finished in real wood veneer and should be treated with the same care with which you would treat fine furniture. It is normal for the appearance of wood veneer to change with the passing of time, but locations in direct sunlight should, if possible, be avoided. Furthermore the cabinet should not be allowed to become wet.

Each Reference Series 208 subwoofer is supplied with KEF designed substantial spikes and locking nuts (also in the care pack). This enables fine adjustment of level, depending on your preferred location of the loudspeakers whatever the floor covering: carpet, tile or block wood. In addition to the spikes and locking nuts each Model 208 also comes with casters. The casters should only be used for transporting and moving the subwoofer as they do not offer the stability required when the subwoofer is in operation.

Accessories



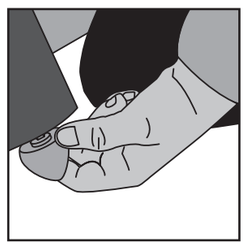
Adjusting the Feet

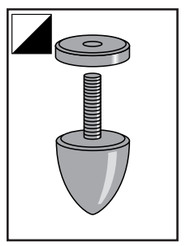
Under normal circumstances your subwoofer will be commissioned by your retailer or consultant, who will have been trained in their installation by KEF.

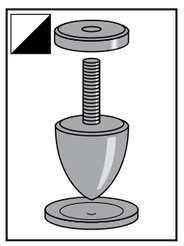
KEF strongly recommend that you do not attempt to level your loudspeakers single-handed. Recruit the assistance of another adult - or consult an authorised KEF Reference outlet for assistance which may be chargeable if the purchase was not made through them originally.

The feet and locking nut combination supplied is designed to provide small adjustments, not to compensate for seriously irregular floors.

Best results will be obtained if the subwoofer is level and stable. Check the general stability of the subwoofer by gently rocking it from side to side, front-to-back and diagonally. Adjust the height of each foot to ensure that the subwoofer does not rock at all.







Subwoofer Positioning

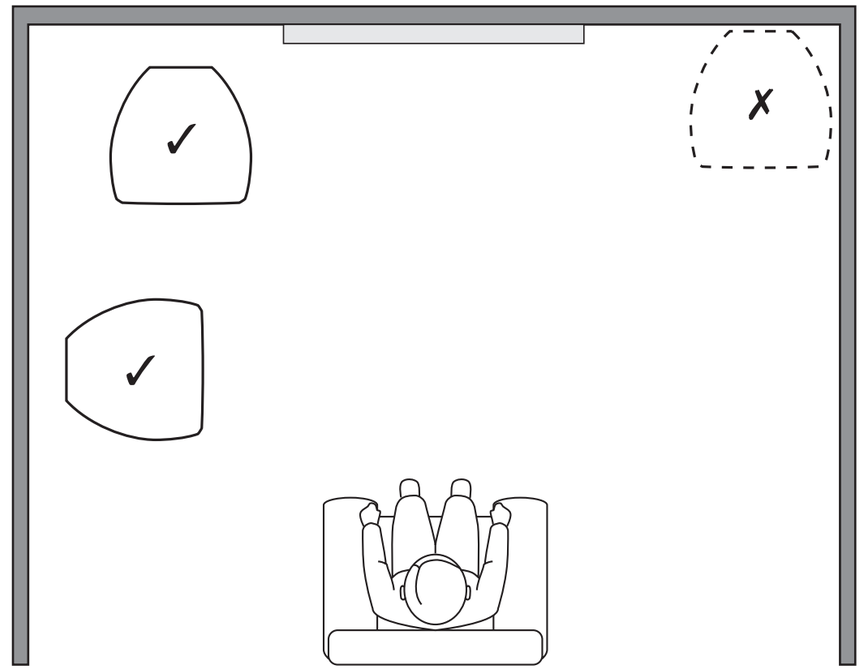
The listening room is one of the most variable elements in the hi-fi chain and its effect cannot be emphasised too strongly, nor can its effects be reliably predicted.

As the sub-bass (low frequency) sound produced by the subwoofer is close to omni-directional, positioning of the subwoofer is less critical than with full range conventional speakers. However, it is advised that the subwoofer is not positioned too close to the listener.

It is often recommend that subwoofers are not placed in the corners of the room, near soft furnishings (which will deaden the sound) or near reflective surfaces (which may brighten up the sound).

As all rooms are different it is best to experiment with the location of the subwoofer until you are happy with the sound.

KEF recommend you move the Reference Series 208 subwoofer into a few acceptable positions and compare the sound. Pick the location which gives the most satisfying sound available from the room.



Rear Panel Information

110V or 240V Voltage Selection Switch.
Please check that the voltage indicated is set correctly for your country's mains supply voltage as this subwoofer comes with a 110V to 115V or 220V to 240V voltage switch.

On/Off switch.
Please turn off your subwoofer during long periods of non-use.

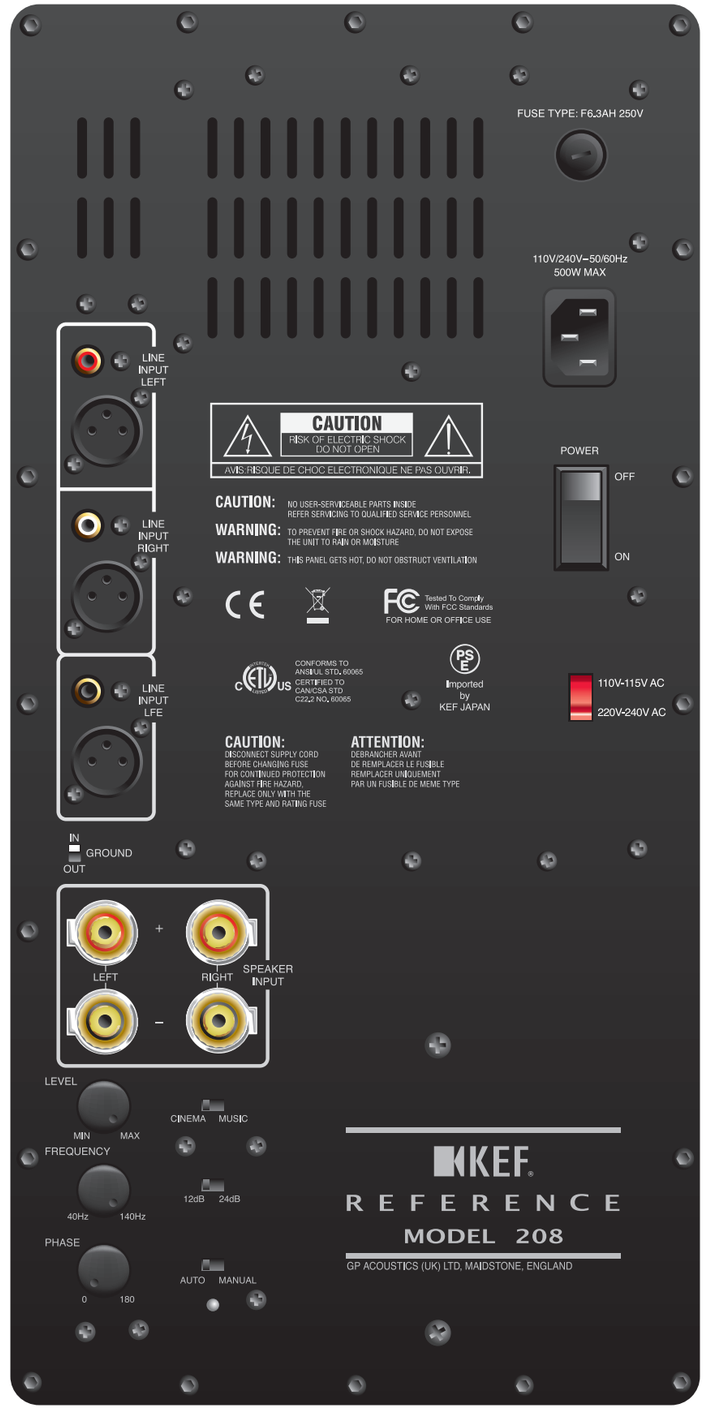
Speaker/high level input.
Used when the subwoofer is to be driven from the output of the main speaker power amplifier.

Line input left and right.
These are used to connect the subwoofer to the line level signal from a pre-amplifier. Please note that single ended (phono) or balanced (XLR) connections are available however they must not be used simultaneously. If only one set of line outputs is available on your pre-amplifier use Y connectors to split the L and R signals between the pre-amplifier and the KEF Reference 208 subwoofer or use the Line level LFE input described below.

Line input LFE.
This dedicated line level input is specifically for an LFE (Low Frequency Effects) output from a surround sound processor. Please note that single ended (phono) or balanced (XLR) connections are available however they must not be used simultaneously. The LFE input to the subwoofer is not affected by the frequency or slope controls and it will not, therefore, conflict with the bass management settings applied by the external surround sound processor.

Ground Switch.
The default setting is with the Ground Switch IN. This connects the mains earth to the audio input circuitry. If, however, there is a buzzing noise, caused by ground loops between the audio source equipment and the ground of the Reference Series 208 subwoofer, then switch the Ground Switch to OUT.

Auto/Manual Switch.
The default setting is with the Reference Series 208 subwoofer switched into AUTO. This will automatically put the subwoofer into standby after approximately 30 minutes of silence. The subwoofer will return from standby as soon as a source signal is detected. This function can be disabled by setting the subwoofer to MANUAL and using the power switch to turn it on and off.



Control Functionality

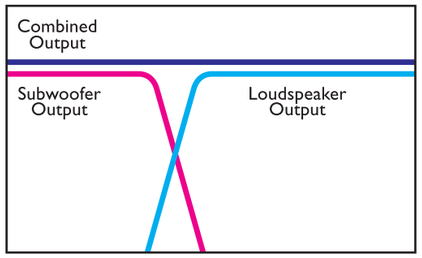
Phase.
Adjusts the phase of the subwoofer output relative to your main speakers from 0 to 180 degrees in 5 degree steps.

Level.
This decreases or increases the subwoofers volume relative to the main speakers.

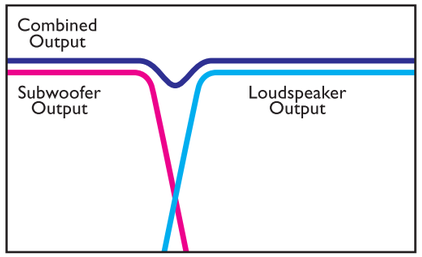
Slope.
Switches the Low Pass Filter slope between 12 (shallow) and 24dB per octave (steep). This can be set to allow the best integration with your other speakers. Frequency and slope only apply to the Left and Right line level inputs. The LFE inputs are fixed at a cut off frequency of 200Hz and a slope of 24dB/Octave so that the settings do not interfere with the bass management setting on an external A/V receiver.

Frequency.
Increases or decreases the internal low pass filter cut off frequency in the subwoofer between 40Hz and 140Hz so that it integrates smoothly with the main speakers. It is only applied to the Left and Right inputs and is not applicable to the LFE input where it is assumed an external surround sound processor is controlling the bass management externally

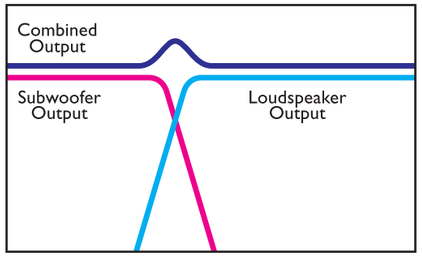
Subwoofer/Satellite Integration : Correct



Subwoofer/Satellite Integration : Too Low.
Increase the frequency.



Subwoofer/Satellite Integration : Too High.
Reduce the frequency.

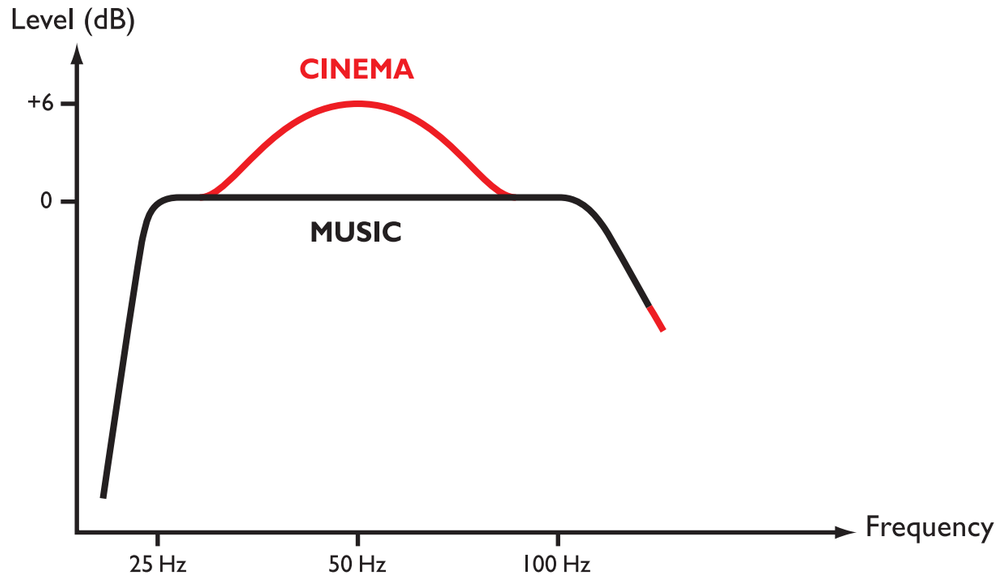


Music and Cinema Setting
The Music and Cinema Switch changes the internal EQ settings on the Reference Series 208 subwoofer. Music is a flat response as shown below. Cinema adds a mid-bass boost of 6dB.

This EQ is applied for both the Left and Right and the LFE inputs.

MUSIC Standard Flat Response

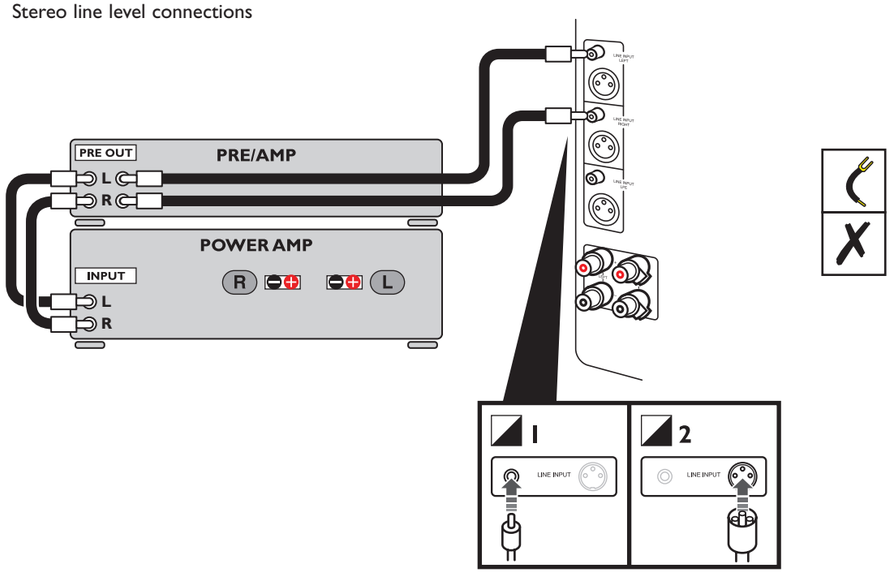
CINEMA Mid Bass Lift



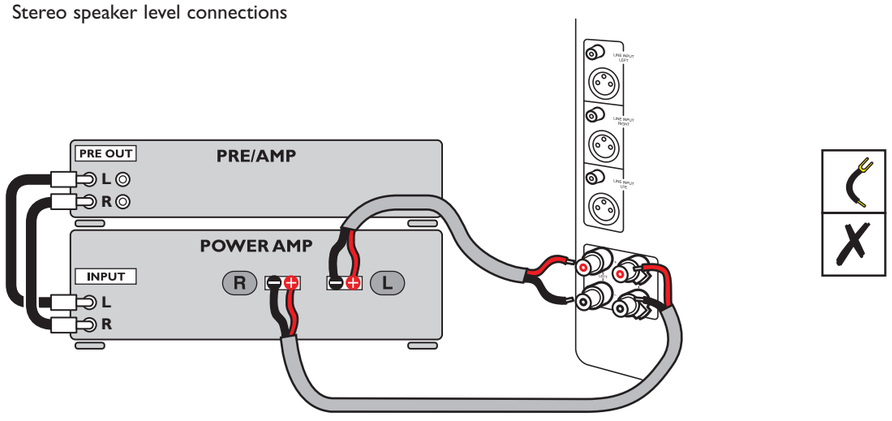
Connections, Setup and Fine Tuning

All connections should be made with the amplifier switched OFF. Ensure the integrity of all connections prior to switching the amplifier ON.

Stereo line level connections



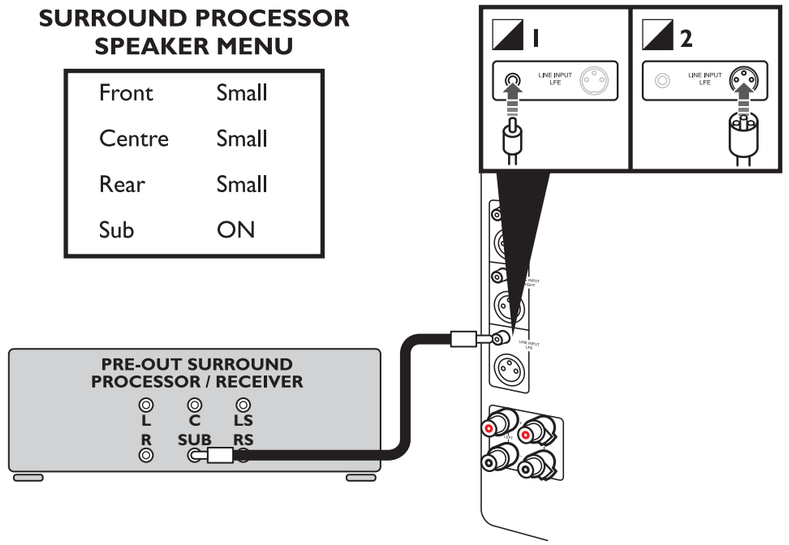
Stereo speaker level connections



LFE line level connections
(For use with bass limited (small) main loudspeakers)

SURROUND PROCESSOR SPEAKER MENU

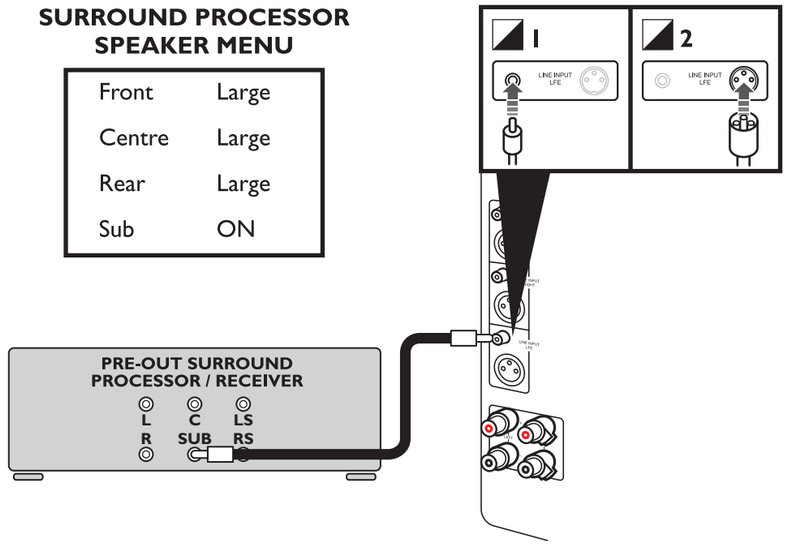
Front	Small
Centre	Small
Rear	Small
Sub	ON



LFE line level connections
(For use with full range (large) main loudspeakers)

SURROUND PROCESSOR SPEAKER MENU

Front	Large
Centre	Large
Rear	Large
Sub	ON



Movie only setup through the LFE input.

This dedicated line level input is specifically for the LFE (Low Frequency Effects) output from a surround sound A/V processor. Please note that single ended (phono) or balanced (XLR) connections are available, however, they must not be used simultaneously. The LFE input to the subwoofer will not be affected by the Frequency or Slope controls which apply only to the Left and Right channel line inputs.

Once your subwoofer is connected and powered up it needs to be integrated into your home cinema system. To do this you will need to follow the set-up procedure for your surround sound processor. Set the subwoofer level to near maximum and the phase to 0. In the surround sound processor's speaker menu, ensure that the subwoofer is set to 'on'. If using smaller satellite speakers then set the speaker size to 'small'. KEF would recommend starting with the 'small' setting if you are unsure.

If you are using full range speakers set the speaker size to 'large'. Use the processor's controls to adjust the level of the subwoofer at the same time as setting each of the channel levels.

Music only setup through the Left/Right inputs.

To increase the low-frequency extension of your existing stereo speakers connect the amplifier's line level outputs to the subwoofer Left and Right line level inputs. If line level outputs are not available then connect the Left and Right amplifier high level speaker outputs to the speaker inputs of the subwoofer. Once the subwoofer is connected and the power is switched on it needs to be acoustically integrated into your existing system. To do this you will need to use the Level, Frequency and Phase controls.

First select the subwoofer low-pass filter slope to match your main speakers. For a bass reflex speaker the slope should be set to 24dB/octave. This applies to all the KEF Reference Series loudspeakers. For a closed box loudspeaker, however, the slope should be set to 12dB/octave.

Select a piece of music that you are familiar with which has a constant, repetitive bass line. Start with the Level and Frequency controls at the middle positions and the phase control set to 0. Adjust the level control until you are happy with the low frequency levels when compared with the main speakers. Now adjust the Frequency control so that there is no obvious change in the level of the sound from very low frequencies to higher frequencies. Adjust the polarity and the phase control to achieve the smoothest integration between the subwoofer and the main speakers. KEF recommend you take some time making fine adjustments to the controls, whilst listening to a varied selection of music, until you are satisfied with the sound balance.

Combined movie and music setup.

The Reference Series 208 subwoofer can be used for both main speaker low frequency extension and the LFE channel reproduction for a surround sound system.

Set the subwoofer up as described in section 'Music Only Setup'. With the subwoofer correctly set up for stereo use, connect the LFE output from your surround processor to the LFE line level input of the subwoofer. Without making any adjustments to the subwoofers controls, including the volume level, follow the set-up procedure on your surround processor to adjust the subwoofer volume level (as described in section 'Movie Only Setup').

Connecting to the speaker inputs (high level).

Speaker level or line level inputs are available to allow flexibility in set-ups for the Left and Right inputs. The specific LFE input is line level only to interface with an A/V processor.

The speaker input terminals will accept bare wire, spade or 4mm connectors. Most good quality loudspeaker cables have some indication, such as colour coding or 'ribbing' on the insulating material, indicating which conductor is '**+**' or positive. Connection to the subwoofer can then be made as follows:

The left channel amplifier output terminal marked '**+**' or coloured RED connects to the left subwoofer speaker input terminal marked '**+**'. The left channel amplifier output terminal marked '**-**' or coloured BLACK connects to the left subwoofer speaker input terminal marked '**-**'. Similarly, these instructions should be followed for making connections between the right channel amplifier output and the right subwoofer speaker input terminals. Correct polarity, or phase, is vital to the proper operation of the system.

Bare wire connections are the simplest to achieve and involve stripping 12.5mm (1.2in.) of insulation to expose the loudspeaker wire core. (You should twist together, using clean fingers, the ends of each multi-stranded core prior to the next stage to ensure a good signal contact). Having unscrewed the lower terminal cap, push the wire through the exposed hole in the terminal body and screw the cap down tightly. Make sure that no stray strands come into contact with the opposite terminal; this could cause a short circuit between the terminals and may damage your amplifier.

Be aware that a higher quality run of cable will always give a more rewarding presentation than multiple runs of an inferior cable.

Poor quality cables can seriously compromise the overall sound of your hi-fi system.

KEF recommends that high quality loudspeaker cable be used for connecting to your Reference Series Model 208 subwoofer high level inputs. It is good practice to keep the cables as short as possible.

Grille

A dedicated grille assembly is supplied with your subwoofer. The grille is held on via 'pegs' that locate into the front baffle grille-peg sockets. However, if you wish, you may remove the grille by gently pulling it forward toward you.

If required, the grille may be removed during use. KEF suggest the removal of the grille for serious listening. However, we strongly recommend replacing the grill after use.

For cleaning purposes, the grille should be removed from the cabinets and brushed lightly with a soft brush. Alternatively, use a variable suction vacuum cleaner, with soft brush attachment.

Warranty

Your Reference Series Model 208 subwoofer is guaranteed against manufacturing defects in both materials and workmanship. For further details of how this guarantee affects you, please read the enclosed Warranty leaflet.

It should be noted, however, that failure of the loudspeaker due to abuse, improper or inappropriate use and/or operation or damage caused by other faults in your system are NOT covered within the terms of the guarantee.

Service Information.

It is important to remember that faults arising in any part of the reproducing system will be heard via the loudspeakers and therefore when faults occur, careful and analytical diagnosis will be required to locate the actual source of trouble.

Faults in a loudspeaker will be audible on all programme sources. A fault which is evident only when playing CDs but not, for example, when using a radio tuner is unlikely to originate with the loudspeakers.

Service problems should be discussed in the first instance with the dealer from whom the loudspeakers were originally purchased. Generally, warranty claims are best handled by your dealer.

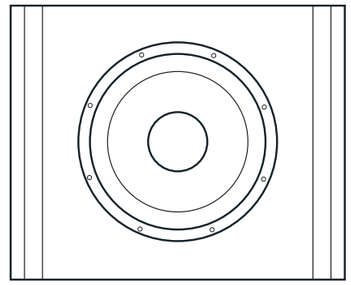
However, in case of difficulty, please contact:

Customer Services Department.
KEF Audio (UK), Eccleston Road, Tovil,
MAIDSTONE, Kent, ME15 6QP UK.
Telephone No.: +44 (0)1622 672261
Fax No.: +44 (0)1622 750653

www.kef.com

Specifications

MODEL 208



Design :
Bass Reflex, magnetically shielded

Drive Unit Array :
300mm (12in.) long-throw LF

Frequency Response :
(± 3dB)
25Hz - 200Hz

Amplifier :
500W built in

Sensitivity :
(2.83V / 1m)
Active system

Maximum Output :
117dB

Low Pass Filter Range :
40Hz to 140Hz (-3dB)

Phase Adjustment Range :
0 to 180 degrees

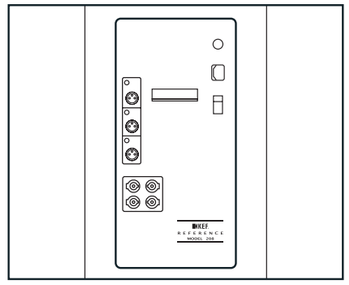
Impedance :
Active system

Bass Extension :
22Hz (-6dB)

Weight :
40.2kg (88.4lbs)

Dimensions (H x W x D) :
465 x 576 x 579 mm
18.3 x 22.7 x 22.8 in.

Finishes :
Piano Black
High Gloss Cherry
High Gloss American Walnut
Satin Sycamore
Satin Black
Satin Cherry
Satin American Walnut



Photograph : Martyn Goddard. Courtesy Sunday Telegraph Colour Supplement.

KEF Heritage

KEF was founded in 1961 by an electrical engineer named Raymond Cooke in a Nissen Hut on the premises of a metalworking operation called Kent Engineering & Foundry (hence KEF), on the banks of the River Medway, near Maidstone in Kent.

From the beginning KEF was destined to become a company with a flair for the unusual and controversial in terms of loudspeaker engineering, design, and use of materials. Within a year, KEF, under Cooke's outstanding vision, was planning loudspeakers with bass units using foil-stiffened, vacuum-formed, expanded polystyrene diaphragms and a Melinex or Mylar tweeter. This idea was manifested in the K1, an immediate success, followed by the bookshelf model, Celeste, a loudspeaker with an even more significant commercial success and one that helped secure the early financial stability of the new company.

Re-establishing a previous relationship with the BBC in 1966, Cooke was interested in adopting another material, Neoprene (an artificial rubber) to help maintain sound quality in the mid-band by using it as the surround to the loudspeaker diaphragm, while using new materials for the diaphragm itself. Cooke was always looking for new materials and settled on Bextrene as a solution, as its lightweight plastic sheet-like properties were flexible enough for shaping and the material remained stable under varying temperature and moisture conditions and was smooth and consistent over a wide bandwidth. As a result, in 1967, two new drive units, the 5in. B110 and 8in. B200 appeared which, with their countless applications, found use in some 3 million systems from KEF and many other loudspeaker brands throughout the world. A new, smaller tweeter also arrived, the T27, which led to the most famous BBC/KEF collaboration, the LS3/5A, of which some 100,000 units were sold world-wide.

During the 1960's KEF flourished. Loudspeakers such as the Concord, Concerto and Cresta and then, in 1969, the Chorale began to shape the company's growing reputation as 'The Loudspeaker Engineers', a fact justly recognized in 1970 when KEF received the first of two Queen's Awards for Export Achievement.

The 1970's

By 1973 the company was developing the concept of computer assisted 'Total System' design, at a time when the world's very first 4-bit microprocessor was still in its infancy. KEF engineers, using a given set of parameters, could for the first time actually "see" what the response characteristics of a loudspeaker system would be. KEF was the first loudspeaker company in the world to take the new technology seriously in order to achieve this. Now it was the use of computers and digital test methods which provided the KEF engineers with the relevant crossover and drive unit data at a glance, thus dramatically improving their ability to produce loudspeakers of outstanding accuracy. Amongst other benefits, KEF loudspeakers could now be computer matched as an almost identical pair - to within one-half of a dB.

1973 then saw the introduction of the first KEF Reference Series Model, the 104 which swept reviewers, distributors, retailers and customers off their feet. The archetypal 'domestic monitor' 104 provided the standards of a broadcast monitor loudspeaker in a domestic package, probably for the first time.

With the installation of a Hewlett Packard computer at the Maidstone Head Office in 1975, the Corelli, Calinda, and Cantata were all designed under the total system concept and with them came a second Queen's Award for Export in the same year.

1977 saw the most radical KEF design yet in the Model 105 which apart from setting new standards for flat frequency response introduced a design by which the mid and treble were split from the bass box and placed within a contoured moulded enclosure above the bass enclosure. The added ability to angle the separate unique head unit provided the opportunity for the user to tailor the 105 to his or her own environment. The loudspeaker was of such general importance and consumer interest that a leading quality UK Newspaper, The Daily Telegraph, featured the Model 105 on the front cover of its magazine supplement. More Reference Models were to follow. 1978 saw the launch of the 101 and 103 and, in 1979 a further refined 105/2 Model appeared.

The Model 105/3

'Total System' design testing equipment

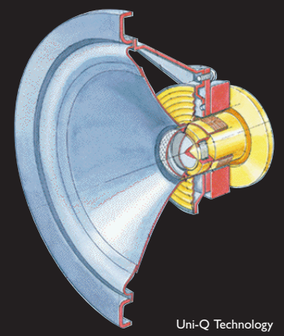
The 1980's

Ten years of growth world-wide followed, peaking with a massive onslaught on the lucrative and influential US market in 1985 with the setting up of KEF Electronics of America, seen as the appropriate recognition of this important market-place.

1986 saw more activity amongst the now world famous KEF Reference Series; the 104/2, always regarded as one of the world's truly outstanding loudspeakers since its 1984 launch spawned the 107, in reality an evolution of the 105/2 but with KEF's coupled-cavity bass loading, a system which positions the drivers internal to the enclosure, each separately loaded and firing into a third common chamber which delivers very tight and accurate bass to the listening area via a substantial front-mounted port. This combines the taut sonic character of a sealed box with the higher sensitivity of a reflex design and succeeds in providing a huge boost to bass performance. Also came the 102 and the 103/3, both accepted by recording and broadcast engineers as ideal monitors. KEF's reputation as loudspeaker engineers was set in stone. As well as the coupled-cavity bass loading system, KEF Reference loudspeakers boasted such highly sophisticated features as a conjugate load network technique, which makes even a complicated loudspeaker design simplicity itself from the amplifier's perspective and a heavily damped midrange module which preserves low coloration and fine stereo. A force cancelling rod, fitted between the vertically opposed bass units was an added introduction, eliminating the possibility for coloration caused by woofer vibrations exciting the enclosure panels.

Amidst all this excitement, 1988 also brought in the birth of the KEF Custom Installation loudspeakers, a move made in response to new world market demands. The same exacting engineering standards were naturally applied to the range and the CR200F and its sub-bass partner, the CR250SW set new standards from in-wall/ceiling units.

Then, again in 1988, came Uni-Q. A design process, painstakingly evolved by KEF over several years, by which a single point source at last became a reality. The HF units made use of a rare-earth magnet material, Neodymium/ Iron/Boron which was developed for the NASA Space Programme.10 times more powerful than a conventional loudspeaker magnet, this material allowed KEF engineers to make a tweeter small enough to fit within the bass unit coil former at the precise acoustic centre of the cone. KEF's Uni-Q technology delivered well-defined stereo imaging over a much wider listening area without the need for the time honoured sacred "hot-spot" in the listening room. The 105/3 was a massive success, bringing together, not just Uni-Q (now in its second generation form), but all of KEF's magnificent technology - coupled-cavity bass loading, conjugate load matching, force cancelling rod, computer matched crossovers and drive units, even hand pair-matched veneer finishes - in fact almost everything by which KEF had made its name as the world's foremost loudspeaker company - in to one product. It was voted Best Imported Speaker by the Japanese Press in 1992.



Uni-Q Technology

The 1990's

Under new ownership in 1992 KEF Audio found itself equipped with new ideas, new personalities and new products. But the same philosophies of solid engineering and innovation to provide the finest quality product available at its particular price-point remained firmly at the bed-rock.

In 1994 and 1995 the company brought out the versatile and appealing Q Series, offering all the benefits of a third generation Uni-Q driver but in a shielded format for AV use, together with the multi-award winning Model 100 Centre Loudspeaker, the Model 90, the new Model 200C and the Reference Series Models One, Two, Three and Four. KEF also introduced the new entry level Home Theatre System for true audiophile home theatre sound at a price to fit most pockets. At the end of 1994 the company had quietly launched three loudspeakers that were to become one of the most spectacular success stories in recent KEF history. These were simply called Coda; affordable loudspeakers that took the world's Press by storm, the baby Coda 7 clinching the coveted UK Magazine What Hi-fi?'s "Best Buy" Loudspeaker of the of the Year Award for 1995.

KEF's founding father, Raymond Cooke O.B.E., sadly died during 1996, but with the knowledge that all of his original and noble principles remained intact, and would always do so.

Recognition that year for the Reference Series Model Four had reached a peak with world-wide acclaim. Reviews by internationally famed and respected writers were quick to praise the merits of the company's new flagship model with its fourth generation Uni-Q driver and to point out the sheer engineering excellence of the company - an unswerving KEF attribute for over 30 years. Comments such as "the best I've had in my listening room." from the US magazine Stereophile and "KEF's best yet" from UK magazine Hi-fi News were just two of the many plaudits showered on the Model Four.

The home theatre series boomed and the company introduced the Model 20B, a baby brother for the Model 30B active subwoofer. The Coda Series, particularly the Coda 7, continually outsold competing brands throughout the world. 1996 also saw the launch of the new Q Series and the new Monitor Series, superbly crafted loudspeakers to meet the challenges of the next century. Both ranges epitomise KEF's total commitment to engineering qualities beyond all. As the 90's drew to a close, KEF introduced the Reference Series Model 109 - The Maidstone. Over thirty five years of technical excellence, innovation in design and award winning engineering combined in one stunning loudspeaker. (Pictured Opposite).

KEF's acclaimed Reference Series

The 2000's

The millennium ushered in a new era of groundbreaking audio innovation.

Among the most important was the launch of a new Reference Series - the forerunner of today's design - in 2002. This redefined the benchmark for high-end loudspeakers by incorporating signature KEF technologies such as Uni-Q and the 'pod' concept.

The decade had begun with the introduction of a product destined to become a design icon in its own right: the KHT (KEF Home Theatre) 2005 system. With satellite loudspeakers nicknamed 'KEF eggs' because of their distinctive elliptical shape, KHT2005 represented a real breakthrough not only in terms of the build quality and sonic performance that it offered but at a price that many found "very reasonable indeed".

With the rising demand for home entertainment systems, the KHT series steadily grew to encompass both smaller and larger variants. The concept proved a worldwide success, with all models earning enthusiastic reviews and a plethora of awards, and the expanded range remains popular today.

Another patented KEF innovation of the 21st century was Acoustic Compliance Enhancement, or ACE. This technology was developed in the constant quest to resolve a fundamental dilemma of loudspeaker design: how to optimise the trade-off between the large cabinet size required for maximum bass extension and popular demand for smaller, less obtrusive loudspeakers in modern living rooms.

ACE largely succeeded in overcoming these conflicting constraints by adding granules of activated carbon inside the driver enclosures. By a molecular process known as adsorption, the presence of the granules makes each enclosure sound twice as big as it actually is.

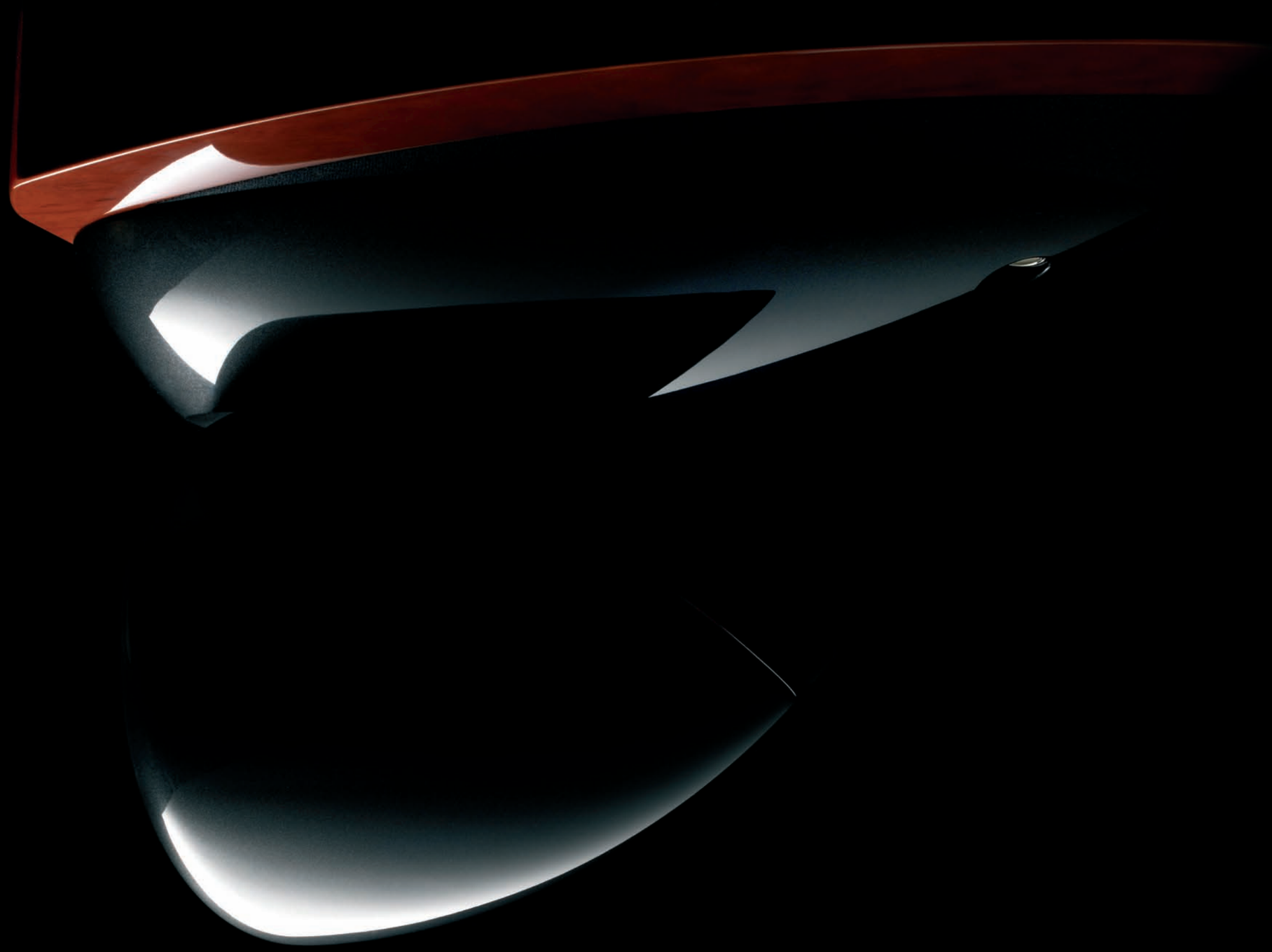
Yet more KEF innovations soon followed. The KIT (KEF Instant Theatre) concept, for example, proved an immediate hit - an integrated multimedia home entertainment system for consumers who want a complete, user-friendly package that offers quality sound without being complicated to set up.

One of the most revolutionary aspects of the design is that it delivers the apparently impossible: a three-dimensional surround sound image from only two loudspeakers. This was achieved by adding two flat panel drivers behind each front loudspeaker driver to act as rear loudspeakers by radiating the sound behind the listening area. This radical concept has since been applied to other KEF home entertainment products.

The launch of the new Q Series in 2005 further strengthened KEF's position as an acknowledged market leader in mid-priced audiophile quality loudspeakers. With its high performance Uni-Q driver array, distinctive curved cabinets and outstanding build quality and finish, the new range was soon being referred to as "the baby Reference".

Since then though, the Reference has evolved further still. True to our vision and roots as high-end audio designers, KEF engineers have been concentrating on raising the bar in terms of ultimate sonic performance. And the result, it has to be said, is outstanding. When the latest KEF Reference technologies were showcased at the prestigious High End 2006 audio show in Munich, prototypes for our new 'Austin' (pictured opposite) concept loudspeakers were voted by some the best sound of the show in independent comparative tests.

Now as in '61, it's all about greatness by design.



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